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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/715,690	11/16/2000	Anne E. Miller	42390P8842	4781

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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 03/17/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/715,690

Applicant(s)

MILLER, ANNE E.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-16 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, 6-11, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman et al. (US 5,954,997) in view of Feller et al. (US 5,700,383) and further in view of Grumbine et al. (US 6,083,419).

As pertaining to claims 1, 4, 7, 11, and 13, Kaufman teaches a slurry comprising a mixture (column 5, lines 1-5) of:

a surfactant (column 4, line 54 and column 6, lines 36-41);

an abrasive such as silica (column 7, lines 1-5);

an oxidizer such as hydrogen peroxide (column 4, line 52); and

a corrosion inhibitor such as benzotriazole (column 4, line 54), wherein the slurry has a pH in the range of 2.0 to 12.0 (column 8, lines 22-25), which encompasses the slurry that has a pH between 2.5 and 7.0.

Kaufman differs only in failing to teach a chelating buffer system, **in claims 1, 6, and 16.**

Feller teaches citric acid (chelate) and potassium citrate buffer (same as applicant's chelating buffer system), which has a concentration that is high enough to

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maintain a pH, but low enough to ensure solubility and keep cost down (column 5, lines 19-20 and 41-44).

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Kaufman by employing a buffer system as taught by Feller for the purpose of maintaining a slurry having a constant pH.

Kaufman in view of Feller differs in failing to teach a surfactant containing an alkyltrimethylammonium cation, **in claims 1 and 11**; comprising cetyltrimethylammonium bromide, **in claims 2, 8, and 10**; comprising cetyltrimethylammonium cations and halogen anions, **in claims 3**; and comprising cetyltrimethylammonium hydroxide **in claim 9, and 14**.

Grumbine teaches a cmp slurry comprising corrosion inhibitors that produce alkyl ammonium ions in aqueous solutions upon dissolution, that include cetyltrimethylammonium hydroxide, tricaprilmethylammonium chloride, and tetramethylammonium hydroxide and mixture thereof, and that range from 0.001 to about 2.0 weight percent (column 4, lines 6-10 and column 5, lines 16-26 and 27-30). Hence, the combination of these inhibitors in an aqueous medium inherently produces the same compounds as applicant's corrosion inhibitors and surfactants, as claimed in the present invention.

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Kaufman in view of

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Feller by using the corrosion inhibitors as taught by Grumbine for the purpose of minimizing surface corrosion on metallic layers.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman ('997) in view of Feller ('383) and Grumbine ('419), as applied to claim 1 above, and further in view of Neville et al. (US 5,527,423).

Kaufman in view of Feller and Grumbine differs in failing to teach the chelating buffer system comprises ammonium bicitrate and potassium dissolved in the mixture.

Neville teaches oxidizing components such as citrates, potassium salts, ammonium salts, quaternary ammonium salts, and mixtures thereof may be added to a polishing slurry and the amount of the oxidizing component is sufficient to balance the mechanical and chemical (colloidal stability) polishing components of the slurry (column 5, lines 8-27).

It is the examiner's position since Neville's oxidizing components when mix would inherently produce the same components as applicant's chelating buffer system, then it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Kaufman in view of Feller and Grumbine by combining Neville's oxidizing components for the purpose of polishing a metal while minimizing surface imperfections (see Neville, column 6, lines 52-56).

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4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman ('997) in view of Feller ('383) and Grumbine ('419), as applied to claim 11 above, and further in view of Kato et al. (US 5,904,159).

Kaufman in view of Feller and Grumbine differs in failing to teach an abrasive comprises silica abrasive having a surface area of  $500 \text{ m}^2/\text{g}$ .

Kato teaches an abrasive comprises silica that has a surface area of  $500 \text{ m}^2/\text{g}$  and an average particle size from 55 to 5 nm, which is in a range that is necessary for obtaining good preservation stability and preventing the polished surfaces from being scarred (column 4, lines 24-36)

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Kaufman in view of Feller and Grumbine by using the abrasive as taught by Kato for the purpose of preventing the polished surfaces from being scarred.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman ('997) in view of Feller ('383) and Grumbine ('419) as applied to claim 11 above, and further in view of Tsai et al (US 5,575,706).

Kaufman in view Feller and Grumbine differ in failing to teach a slurry having a density of 1.03 g/ml.

Tsai teaches parameters that affect the polishing rate include slurry particle density and the adjustment of this parameter permits control of the polishing and

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planarization processes (column 1, lines 61-66) and suggests that the density is a variable parameter.

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Kaufman in view Feeler and Grumbine by varying the density of the slurry as taught by Tsai for the purpose of improving the performance of the polishing process.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

ltue  
March 14, 2003

  
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SUPERVISORY PATENT EXAMINER  
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